Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A method for automatically locating a boundary of an object of interest in a field of view, the method comprising:

forming an electronic image of the field of view containing the object, wherein the electronic image is formed of a plurality of image pixels;

identifying groups of the image pixels that represent edge segments of the object;

forming patches around the image pixel groups, wherein each patch is dimensioned and positioned to entirely contain one of the image pixel groups; and

performing a patch merge process that merges any two of the patches together that meet a predetermined proximity threshold relative to each other to form a merged patch that is dimensioned and positioned to entirely contain the two merged patches, wherein the merge process continues for any of the patches and the merged patches meeting the predetermined proximity threshold until none of the patches and the merged patches meet the predetermined proximity threshold.

2. (Original) The method of claim 1, further comprising:

associating all the edge segments contained within one of the merged patches as representing the boundary of the object.

3. (Original) The method of claim 1, wherein the predetermined proximity threshold is a predetermined number of the image pixels shared by any of the patches and merged patches that overlap each other.

4. (Original) The method of claim 1, wherein the predetermined proximity threshold is a predetermined distance between any of the patches and merged patches.

5. (Original) The method of claim 4, wherein the predetermined distance is measured from boundaries of the patches and merged patches.

6. (Original) The method of claim 4, wherein the predetermined distance is measured from center portions of the patches and merged patches.

7. (Original) The method of claim 1, wherein the predetermined proximity threshold is calculated from the sizes and separation distances of the patches and merged patches.

8. (Original) The method of claim 1, wherein the forming of the patches further comprises:

dimensioning each of the patches as small as possible while still entirely containing one of the image pixel groups.

9. (Original) The method of claim 8, wherein after the dimensioning of the patches as small as possible, the forming of the patches further comprises:

expanding each of the patches by moving wall portions of the patch away from a center of the patch by a predetermined distance.

10. (Original) The method of claim 9, wherein each of the patches has a rectangular shape.

11. (Original) The method of claim 1, wherein the identifying of the groups of image pixels that represent edge segments of the object comprises:

forming a background level image of the field of view, wherein the background level image is formed of a plurality of background level pixels each corresponding in location to one of the image pixels and each having a pixel value;

classifying as an object pixel each of the image pixels having a pixel value that varies by at least a predetermined amount from the pixel value of the corresponding background level pixel; and

identifying which of the object pixels correspond to an edge of the object.

12. (Original) The method of claim 11, wherein the forming of the background level image of the field of view further comprises:

forming N background electronic images of the field of view not containing any objects of interest, wherein each of the background electronic images is formed of a plurality of background pixels each corresponding in location to one of the background level pixels and each having a pixel value, and wherein N is a positive integer; and

generating each one of the background level pixels by calculating a median value of the pixel values for the background pixels corresponding to the one background level pixel.

13. (Original) The method of claim 12, wherein the formation of the N background electronic images of the field of view includes flowing transparent fluid through the field of view.

14. (Original) The method of claim 12, wherein the forming of the background level image of the field of view further comprises:

standardizing average values of the background pixel values for each of the N background electronic images before the generation of the background level pixels.

15. (Original) The method of claim 14, wherein the standardizing average values of the background pixel values further comprises:

creating a histogram for each one of the N background electronic images, wherein each of the histograms has a peak value that corresponds to an average value of the background pixel values for one of the N background electronic images;

selecting a predetermined average pixel value; and

adjusting the background pixel values for the N background electronic images so that the histograms thereof all have peak values generally equal to the predetermined average pixel value.

16. (Original) The method of claim 15, wherein the predetermined average pixel value is selected such that the adjusted background pixel values do not exceed a maximum pixel value thereof.

17. (Original) The method of claim 11, wherein the classifying as an object pixel further includes:

creating a binary image of the electronic image of the field of view containing the object, wherein the binary image is formed of a plurality of binary pixels each corresponding in location to one of the image pixels, wherein each of the binary pixels is assigned to a first value if the corresponding image pixel value varies by at least a predetermined amount from the pixel value of the corresponding background level pixel, and is assigned to a second value if the corresponding image pixel value does not vary by at least the predetermined amount from the pixel value of the corresponding background level pixel.

18. (Original) The method of claim 17, wherein the identifying which of the object pixels correspond to an edge of the object includes:

re-assigning any of the binary pixels assigned with the first value to the second value that are surrounded by others of the binary pixels all originally assigned with the first value.

19. (Original) The method of claim 1, wherein each of image pixels has a value, and wherein the forming of the electronic image of the field of view containing the object further comprises:

creating a histogram for the electronic image containing the object, wherein the histogram has a peak value that corresponds to an average value of the image pixel values;

selecting a predetermined average pixel value; and

adjusting the image pixel values so that the histogram has a peak value generally equal to the predetermined average pixel value.

20. (Previously Presented) An apparatus for automatically locating a boundary of an object of interest in a field of view, comprising:

an imaging system for forming an electrical image of the field of view containing the object, wherein the electronic image is formed of a plurality of image pixels;

at least one processor for:

identifying groups of the image pixels that represent edge segments of the object,

forming patches around the image pixel groups, wherein each patch is dimensioned and positioned to entirely contain one of the image pixel groups, and

performing a patch merge process that merges any two of the patches together that meet a predetermined proximity threshold relative to each other to form a merged patch that is dimensioned and positioned to entirely contain the two merged patches, wherein the merge process continues for any of the patches and the merged patches meeting the predetermined proximity threshold until none of the patches and the merged patches meet the predetermined proximity threshold.

21. (Original) The apparatus of claim 20, wherein the at least one processor associates all the edge segments contained within one of the merged patches as representing the boundary of the object.

22. (Original) The apparatus of claim 20, wherein the predetermined proximity threshold is a predetermined number of the image pixels shared by any of the patches and merged patches that overlap each other.

23. (Original) The apparatus of claim 20, wherein the predetermined proximity threshold is a predetermined distance between any of the patches and merged patches.

24. (Original) The apparatus of claim 23, wherein the predetermined distance is measured from boundaries of the patches and merged patches.

25. (Original) The apparatus of claim 24, wherein the predetermined distance is measured from center portions of the patches and merged patches.

26. (Original) The apparatus of claim 20, wherein the predetermined proximity threshold is calculated from the sizes and separation distances of the patches and merged patches.

27. (Original) The apparatus of claim 20, wherein the forming of the patches by the at least one processor further comprises:

dimensioning each of the patches as small as possible while still entirely containing one of the image pixel groups.

28. (Original) The apparatus of claim 27, wherein after the dimensioning of the patches as small as possible, the forming of the patches by the at least one processor further comprises:

expanding each of the patches by moving wall portions of the patch away from a center of the patch by a predetermined distance.

29. (Original) The apparatus of claim 28, wherein each of the patches has a rectangular shape.

30. (Original) The apparatus of claim 20, wherein the groups of image pixels that represent edge segments of the object are identified by the at least one processor by:

forming a background level image of the field of view, wherein the background level image is formed of a plurality of background level pixels each corresponding in location to one of the image pixels and each having a pixel value;

classifying as an object pixel each of the image pixels having a pixel value that varies by at least a predetermined amount from the pixel value of the corresponding background level pixel; and

identifying which of the object pixels correspond to an edge of the object.

31. (Original) The apparatus of claim 30, wherein the system forms the background level image of the field of view by:

forming N background electronic images of the field of view not containing any objects of interest, wherein each of the background electronic images is formed of a plurality of background pixels each corresponding in location to one of the background level pixels and each having a pixel value, and wherein N is a positive integer; and

generating each one of the background level pixels by calculating a median value of the pixel values for the background pixels corresponding to the one background level pixel.

32. (Original) The apparatus of claim 31, wherein the system flows transparent fluid through the field of view to form the N background electronic images of the field of view.

33. (Original) The apparatus of claim 31, wherein the at least one processor forms of the background level image of the field of view by:

standardizing average values of the background pixel values for each of the N background electronic images before the generation of the background level pixels.

34. (Original) The apparatus of claim 33, wherein the at least one processor standardizes the average values of the background pixel values by:

creating a histogram for each one of the N background electronic images, wherein each of the histograms has a peak value that corresponds to an average value of the background pixel values for one of the N background electronic images;

selecting a predetermined average pixel value; and

adjusting the background pixel values for the N background electronic images so that the histograms thereof all have peak values generally equal to the predetermined average pixel value.

35. (Original) The apparatus of claim 34, wherein the at least one processor selects the predetermined average pixel value such that the adjusted background pixel values do not exceed a maximum pixel value thereof.

36. (Original) The apparatus of claim 30, wherein the at least one processor classifies the object pixels by:

creating a binary image of the electronic image of the field of view containing the object, wherein the binary image is formed of a plurality of binary pixels each corresponding in location to one of the image pixels, wherein each of the binary pixels is assigned to a first value if the

corresponding image pixel value varies by at least a predetermined amount from the pixel value of the corresponding background level pixel, and is assigned to a second value if the corresponding image pixel value does not vary by at least the predetermined amount from the pixel value of the corresponding background level pixel.

37. (Original) The apparatus of claim 36, wherein the at least one processor identifies which of the object pixels correspond to an edge of the object by:

re-assigning any of the binary pixels assigned with the first value to the second value that are surrounded by others of the binary pixels all originally assigned with the first value.

38. (Original) The apparatus of claim 20, wherein each of image pixels has a value, and wherein the at least one processor forms the electronic image of the field of view containing the object further by:

creating a histogram for the electronic image containing the object, wherein the histogram has a peak value that corresponds to an average value of the image pixel values;

selecting a predetermined average pixel value; and

adjusting the image pixel values so that the histogram has a peak value generally equal to the predetermined average pixel value.